

## SNOWFALL

The April snowfall was considerable over most portions of New York and eastern Ohio, in western and northern Pennsylvania, and the mountainous portions of Maryland, the Virginias, and North Carolina. On the other hand, the upper Lake region had comparatively little, and the greater part of the upper Mississippi and lower Missouri Valleys had either none whatever or too little to be measured.

In northwestern Kansas, the western half of Nebraska and much of South Dakota there was considerable snow, chiefly after the 20th of the month.

In the elevated portions of the regions near or to westward of the Continental Divide, the snowfall was mainly much below normal in the northern area and somewhat below in the southern. Certain districts in about latitudes 37° to 43° had considerable snowfall, especially the Sierra Nevada region.

## SUNSHINE AND RELATIVE HUMIDITY

Rather abundant sunshine prevailed generally during the month in the northern and central areas from the Great Plains eastward to the Atlantic and in the Pacific regions from southern Washington to central California. On the other hand, the sunshine was deficient throughout much of Texas, Oklahoma, eastern Colorado, and New Mexico. Elsewhere it was generally near or slightly below the normal. The relative humidity was above the average from southern Arizona eastward to central Texas and Oklahoma. The plus departures were rather large in some of the areas, as would be expected from the large amount of precipitation received in those regions. Elsewhere the relative humidity was generally near or slightly below the normal.

## SEVERE LOCAL STORMS, APRIL, 1931

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the Annual Report of the Chief of Bureau]

Place	Date	Time	Width of path, yards	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Cattaraugus, Allegany, and Wyoming Counties, N. Y.	2					Snow	Trees, telephone and power lines considerably damaged.	Official, U. S. Weather Bureau.
Pittsburgh, Pa., and vicinity	3-4					Thunderstorm and heavy rain.	25 persons marooned on island; basements flooded; other property damage.	Do.
Havre, Mont., and vicinity	7-9					Wind	Minor damage to windows and signs; considerable loss by blowing soil.	Do.
Clark and Comanche Counties, Kans.	15	2-4 p. m.	9 mi.			Heavy hail	Character of damage not reported; path 19 miles long.	Do.
Edwards County, Kans.	15	4 p. m.	5 mi.		\$10,000	do.	Character of damage not reported; path 10 miles long.	Do.
Pawnee County, Kans.	15	P. m.				do.	Damage heaviest near Rozel; character not reported.	Do.
White Signal, N. Mex.	16	1-1:30 p. m.	1,760-3,520			do.	Roofs considerably damaged; gardens destroyed.	Do.
Adair County, Iowa	18	4:30-5:30 p. m.			10,000	Wind, hail and probably a tornado.	Character of damage not reported	Do.
Dallas County, Iowa	18	P. m.	1,760		6,000	Hail	Buildings and crops damaged; path 3 miles long.	Do.
Lawrence, Monroe, Pike, and Wayne Counties, Miss.	19	P. m.				do.	Considerable damage, character not reported.	Do.
Indianapolis, Ind. (7 miles south of)	20	A. m.				Thunderstorm	3 horses killed; truck and quantity of hay, feed, and other grains destroyed.	Do.
Washington and Oregon	21-23					Wind and dust	Severe injury to fruit blooms, vegetables, and truck; grains blown out; timber and communication lines prostrated.	Do.
Lynchburg, Va.	22	12:15-12:30 p. m.	50		4,500	Tornado	Roofs blown from 24 houses; 1 small building demolished.	Do.
Utah (northern)	22-23					Wind and sand	Overhead wires and trees blown down; 11 freight cars blown from track; many residences damaged and several small buildings wrecked; crops injured; traffic delayed.	Do.
Pallisade, Vineland, and Upper Orchard Mesa, Colo.	24	12.1 p. m.			12,000	Hail	Apricots considerably damaged; other fruits slightly injured.	Do.
Hosston to Gigaland, La.	25	9 p. m.	2-6 mi.		10,000	Thundersquall, hail, and tornado wind.	Buildings and crops damaged; much replanting required; path 55 miles.	Do.
Marletta to Kildare, Tex.	25		3,520			Hail	Corn and fruit severely hurt.	Do.
Belen, N. Mex.	27	3:30 p. m.			2,000	do.	Roofs, orchards, and gardens damaged.	Do.
El Paso, Clint, and Sanderson, Tex.	28-29		1,760			Thunderstorm and hail.	Young crops destroyed; auto tops pierced; livestock killed; path 315 miles long.	Do.
Little Rock, Ark.	30					Severe thunderstorm.	Small buildings floated from foundations; plate glass broken.	Do.

## RIVERS AND FLOODS

By MONTROSE W. HAYES

There were more overflows in April, 1931, than in any other month since June, 1930, but those east of the Rocky Mountains were of minor importance.

Mild weather and rain near the middle of the month produced stages that were slightly above bankful in the Connecticut River, the Chenango (in New York) and the upper Susquehanna (in New York). There was no damage attendant upon the overflows. Some merchandise, valued at \$25,000, in Hartford, Conn., was saved

by being moved to a safe place before the overflow arrived.

Bankful stages were reached by some of the rivers in eastern North and South Carolina, western Alabama, northern Missouri, western Pennsylvania, and southeastern Ohio. The overflows were slight and the reported property damage was small, but three persons were drowned in Ohio.

Roads were damaged to an indeterminate extent by Pawnee Creek, in Pawnee County, Kans.

Floods in Oregon and Washington were of greater consequence than any of those east of the Rocky Moun-

tains, but information in regard to their extent and intensity is still incomplete. A discussion of them will appear in a later copy of the REVIEW.

River stages that were unprecedentedly or unusually low for April prevailed in all of the Mississippi System, except in the Ohio Basin.

Table of flood stages in April, 1931

(All dates in April unless otherwise specified)

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	<i>Feet</i>			<i>Feet</i>	
Connecticut: Hartford, Conn.-----	16	12	16	17.9	13
Chenango: Sherburne, N. Y.-----	8	10	11	8.8	11
Susquehanna: Oneonta, N. Y.-----	12	11	13	14.5	17
Roanoke:					
Weldon, N. C.-----	30	7	9	32.8	8
Scotland Neck, N. C.-----	23	7	11	25.7	9
Williamston, N. C.-----	7	5	18	8.6	13
Neuse:					
Neuse, N. C.-----	15	8	9	15.8	9
Smithfield, N. C.-----	14	7	11	15.8	9
Cape Fear: Elizabethtown, N. C.-----	22	8	10	25.7	9
Peedee: Mars Bluff Bridge, S. C.-----	17	10	11	17.4	11
Santee:					
Rimini, S. C.-----	12	2	11	14.0	6
Ferguson, S. C.-----	12	5	12	12.6	10
EAST GULF OF MEXICO DRAINAGE					
Tombigbee: Lock 10, Demopolis, Ala.-----	39	6	10	42.3	8

Table of flood stages in April, 1931—Continued

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
MISSISSIPPI SYSTEM					
Missouri Basin					
Grand: Chillicothe, Mo.....	Feet 18	21	22	Feet 21.9	21
Ohio Basin					
Kiskiminitas: Saltsburg, Pa.....	8	4	4	8.8	4
Allegheny: Lock 5, Freeport, Pa.....	24	4	4	24.7	4
Hocking: Athens, Ohio.....	17	5	5	17.4	5
Scioto: Larue, Ohio.....	11	4	4	11.1	4
Holston, North Fork: Mendota, Va.....	8	5	5	10.0	5
WEST GULF OF MEXICO DRAINAGE					
Trinity: Dallas, Tex.....	28	1	2	31.7	1
Rio Grande: Del Rio, Tex.....	10	29	29	10.1	29
PACIFIC SLOPE DRAINAGE					
Columbia Basin					
Willamette, Coast Fork: Saginaw, Oreg....	9	1	1	10.4	1
Long Tom: Monroe, Oreg.....	8	Mar. 31	7	12.4	2
North Santiam: Mehama, Oreg.....	15	do	1	16.0	1
South Santiam: Waterloo, Oreg.....	20	do	1	21.0	1
Santiam: Jefferson, Oreg.....	10	do	2	17.5	1
Yamhill: McMinnville, Oreg.....	35	1	3	41.2	1
Willamette:					
Eugene, Oreg.....	12	1	1	13.0	1
Harrisburg, Oreg.....	10	Mar. 31	3	15.0	1
Albany, Oreg.....	20	2	3	22.9	3
Salem, Oreg.....	20	1	2	23.3	2
Oregon City, Oreg.....	12	1	5	15.0	3

## WEATHER OF THE ATLANTIC AND PACIFIC OCEANS

### NORTH ATLANTIC OCEAN

By F. A. YOUNG

The weather over the North Atlantic during April was in marked contrast to that prevailing during the previous month, which was unusually stormy with abnormal pressure distribution. On the other hand, the number of days with gales during the current month was considerably below the normal, and the gales were not reported on more than three days in any 5° square, the maximum occurring in the square between the fortieth and forty-fifth parallels and thirtieth and thirty-fifth meridians. Up to time of writing only 21 vessels have rendered storm reports indicating a wind force of 9 or over; 4 vessels reported highest force 10, and 1 force 11.

Fog was unusually prevalent over the Grand Banks, where it was reported on from 8 to 14 days. The number of days in which it occurred in other localities is as follows: Along the American coast, between the thirty-fifth and forty-fifth parallels, from 6 to 8 days; over the steamer lanes, between the tenth and fortieth meridians, from 1 to 3 days; along the European coast, from 1 to 4 days; in the Gulf of Mexico, 4 days.

In the following table giving the barometric data at a number of island and coast stations, it will be noticed that Julianehaab, Greenland, and Cape Gracias a Dios, Nicaragua, are missing. From the former station reports were received on only 15 days, and from the latter, none since April 14. According to press reports the station at Cape Gracias was attacked and dismantled by Nicaraguan insurgents. Observations were resumed on May 19, however, and the results should appear in the table for June.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, 8 a. m. (seventy-fifth meridian), North Atlantic Ocean, April, 1931

Stations	Average pressure	Departure	Highest	Date	Lowest	Date
	Inches	Inch	Inches		Inches	
Belle Isle, Newfoundland	29.87	+0.04	30.40	21st	29.84	28th
Halifax, Nova Scotia	29.97	+0.04	30.40	13th	29.56	27th
Nantucket	30.00	+0.03	30.42	13th	29.46	2d
Hatteras	30.06	+0.03	30.40	13th	29.26	1st
Key West	30.01	-0.02	30.24	7th	29.80	1st
New Orleans	30.09	+0.05	30.30	6th	29.84	1st
Turks Island	30.05	+0.03	30.16	4th	29.96	16th
Bermuda	30.12	+0.03	30.30	4th	29.84	24th
Horta, Azores	30.21	+0.10	30.44	16th	29.80	7th
Lerwick, Shetland Islands	29.81	+0.01	30.28	19th	29.34	5th
Valencia, Ireland	29.96	+0.07	30.43	13th	29.07	24th
London	29.88	+0.01	30.29	10th	29.12	26th

<sup>1</sup> From normals shown on Hydrographic Office Pilot Charts, based on observations at Greenwich mean noon, or 7 a. m., seventy-fifth meridian time.

<sup>2</sup> From normals based on 8 a. m. observations.

<sup>3</sup> And on other date or dates.

Charts VIII and IX show the conditions on the 1st and 2d when there was a well-developed disturbance, central on the 1st near the Virginia Capes, the storm area that day extending south into the Gulf of Mexico.

On the 3d and 4th unusually strong northeast trade winds occurred in the vicinity of the Canal Zone, as shown by reports from the British steamship *Shirvan*, given in the table of gales. On the same date there was also a disturbance over the Azores, that reached its greatest intensity on the 4th. On the 6th and 7th a slight depression was off the American coast, between the thirtieth and fortieth parallels, and on the same date moderate gales were also reported from vessels in the middle section of the steamer lanes.